

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number
WO 2005/091029 A2

(51) International Patent Classification⁷:
6/22, 6/26, 6/28, H01S 3/067

G02B 6/16,

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(21) International Application Number:

PCT/DK2005/000192

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, US (patent), UZ, VC, VN,
YU, ZA, ZM, ZW.

(22) International Filing Date: 21 March 2005 (21.03.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PA 2004 00447	19 March 2004 (19.03.2004)	DK
60/554,373	19 March 2004 (19.03.2004)	US
PA 2004 00844	28 May 2004 (28.05.2004)	DK
60/575,091	28 May 2004 (28.05.2004)	US

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

(63) Related by continuation (CON) or continuation-in-part
(CIP) to earlier application:

US	60/575,091 (CON)
Filed on	28 May 2004 (28.05.2004)

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

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Published:

— without international search report and to be republished
upon receipt of that report

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(48) Date of publication of this corrected version:

27 October 2005

(15) Information about Correction:

see PCT Gazette No. 43/2005 of 27 October 2005, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OPTICAL COUPLER DEVICES, METHODS OF THEIR PRODUCTION AND USE

(57) Abstract: The present invention relates in general to coupling of light from one or more input waveguides to an output waveguide or output section of a waveguide having other physical dimensions and/or optical properties than the input waveguide or waveguides. The invention relates to an optical component in the form of a photonic crystal fibre for coupling light from one component/system with a given numerical aperture to another component/system with another numerical aperture. The invention further relates to methods of producing the optical component, and articles comprising the optical component, and to the use of the optical component. The invention further relates to an optical component comprising a bundle of input fibres that are tapered and fused together to form an input coupler e.g. for coupling light from several light sources into a single waveguide. The invention still further relates to the control of the spatial extension of a guided mode (e.g. a mode-field diameter) of an optical beam in an optical fibre. The invention relates to a tapered longitudinally extending optical waveguide having a relatively larger crosssection that over a certain longitudinal distance is tapered down to a relatively smaller cross section wherein the spatial extent of the guided mode is substantially constant or expanding from the relatively larger to the relatively smaller waveguide cross section. The invention may e.g. be useful in applications such as fibre lasers or amplifiers, where light must be coupled efficiently from pump sources to a double clad fibre.



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